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EXAMINER KAMPS, FRANCES H				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/592,982

Applicant(s)

USTUN, ORHAN

Examiner

FRANCES KAMPS

Art Unit

3743

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 4/14/2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9 and 15-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9 and 15-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 April 2010 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed April 14, 2010 have been fully considered but they are not persuasive and are moot in view of the new grounds of rejection

2. **In response to Applicant argument:**

"The Examiner asserts that Helmut discloses a heat-conducting element that is contacting the outer wall of the fluid-conducting pipe system and is pre-stressed against the inner wall of the vacuum tube and the fluid-conducting pipe system (based on the word "resilient" on page 2, paragraph 5 of the machine language translation of Helmut). Applicants respectfully disagree. Helmut discloses in column 4, lines 3 to 7, that especially for spiral arrangements ("besonders innerhalb spiralförmiger Anordnungen") it is preferable ("zweckmäßissig") to provide elements 29 as spacers ("Abstandhalter") to provide a diametral connection towards the pipe system 13 ("dass eine diametrale Verbindung zur Wärmeträgerführung zustande kommt"). It is impossible to have rigid spacer elements 29 and resilient heat-conducting elements 23 exerting such a spring-like function in the spiral shape embodiment shown in FIG. 2a. Although it is mentioned in column 3, lines 40 to 43 that such functionality would be realized (assumingly, in the context of the non-spiral embodiment of FIG. 2f), the presence of the spacer elements 29 in the spiral embodiment of FIG. 2a clearly shows that the distance is maintained through the spacer elements 29 and not by any prestress force. Therefore, Helmut fails to disclose the "prestressed" limitation. (pg 7 of 11)

3. **Examiner respectfully responds:**

The spacer element (29) does not preclude a spring-like function from spiral heat-conducting element (3). That would follow the logic that it would be *impossible* for a box spring mattress to utilize spacers along side the mattress springs. It is Examiner's assertion that it seems more likely that without spacer element (29), the helical absorber (3) would either expand to conform to the inside of body (2), or to the outside of the co-axial tube (13). Furthermore, Helmut et al (DE 19859658) teaches that a resilient absorber (3) is utilized in a heat exchanger (paragraph 5).

Additionally, this teaching is also found in Takeuchi et al (US 4,440,156), wherein Takeuchi et al ('156) discloses the use of prestressed heat-conducting elements (col 2, ln 41) connecting the outer wall of a fluid conducting pipe system and an inner wall of a vacuum tube.

4. **In response to Applicant argument:**

Additionally, Applicant respectfully disagrees with the Examiner that it would have been obvious to combine the teachings of Takeuchi relating to means for collecting and concentrating solar energy within the vacuum tube and the fact that the fluid conducting pipe system is a metal wall with the teachings of Helmut for the purpose of maximizing thermal output. (pg 8 of 11)

5. **Examiner respectfully responds:**

Both Helmut et al ('658) and Takeuchi et al ('156) disclose the use of a vacuum tube as the exterior of a solar collector heat exchanger, as vacuum tube vessels are well known in the art to minimize heat losses. Both Helmut et al and Takeuchi et al use a liquid medium in a fluid-conducting pipe system, and resilient heat-conducting elements attached to the pipe system. As they are analogous pieces of art, the teachings of one can be easily applied to modify the other, by one having ordinary skill in the art at the time the invention was made. If, by these teachings, the solar heat transfer is improved, the thermal output of the system will be maximized.

6. **In response to Applicant argument:**

It is mentioned in Helmut that the accumulation of energy within the area 12 is possible due to the presence of the absorber 3 or the webs 23 in this area 12. Takeuchi uses a bent, non-concentric fluid pipe system 4 and support blades 7 and 8 to have a good thermal contact between these elements and the glass tube -- the absorber foil is on the other side of the glass tube.

It has been held that the references used to attempt to obviate a claim must suggest the desirability and thus the obviousness of making the combination (Hodosh v. BlockDrug Co., Inc., 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986)). There is no motivation for someone skilled in the

art to move the absorber 3 from this area in the vacuum tube, because the presence of the absorber 3 in the adsorption room 12 is already optimized. Additionally, someone of ordinary skill in the art would not be able to easily combine the teachings of Helmut with those of Takeuchi because Takeuchi does not have concentric tubes. A creative approach of moving the absorber out of the adsorption area will not improve the resultant device. Therefore, there would be no desirability by one having ordinary skill in the art to use the absorber of Takeuchi in the Helmut heat exchanger. (pg 8 of 11)

7. **Examiner respectfully responds:**

After careful consideration of Applicant's location of the absorber in the vacuum tube, Examiner appreciates the merits of this argument and has appropriately withdrawn the rejection

8. **In response to Applicant argument:**

Applicant respectfully disagrees with the Examiner that it would have been obvious to combine the teachings of Ghela relating to a heat conducting element being attached at the outer wall of the fluid-conducting pipe system with the teachings of Helmut and Takeuchi. (pg 8 of 11)

9. **Examiner respectfully responds:**

Ghela (US 6,619,283) teaches a solar collecting pipe wherein solar energy is transferred to a fluid-conducting pipe, via portions of heat conducting elements. Ghela ('283) teaches that the absorbing (heat conducting) elements may be formed with the fluid-conducting pipe by extrusion (col 11, ln 43) or in direct contact. Helmut and Takeuchi also teach solar heat exchangers that utilize heat conducting elements, but do not disclose the method of attaching the fluid-conducting pipe to the heat conducting elements. It would have been obvious to one having ordinary skill to apply the teachings of Ghela ('283) to the solar heat exchangers of Helmut and Takeuchi, as this knowledge is generally available.

10. In response to Applicant argument:

However, there is no motivation for the combination of the teachings of Helmut and Ghela to use the isolated feature from the teaching of Takeuchi to move the absorber out of the adsorption area (element 12, in Helmut; vacuum volume 79 in Ghela) into an exterior vacuum tube (which is only available in Helmut, as Ghela has an integrated tube; this is an additional difference).

Applicant therefore respectfully submits that the Examiner's obviousness rejection is based on hindsight reconstruction (pg 9 of 11).

11. Examiner respectfully responds:

After careful consideration of Applicant's location of the absorber in the vacuum tube, Examiner appreciates the merits of this argument and has appropriately withdrawn the rejection

12. In response to Applicant argument:

Furthermore, if the teachings of Ghela are used in combination with those of Helmut (and/or Takeuchi), the teaching of FIG. 17 must be used, because only FIG. 17 of Ghela uses a specific conduit similar to that of Helmut and Takeuchi, instead of an integrated solution that is depicted in FIGS. 15 and 16 of Ghela (pg 10 of 11).

13. Examiner respectfully responds:

The purpose of the teaching of Ghela ('283) was that the absorbing (heat conducting) elements may be formed with the fluid-conducting pipe by extrusion (col 11, ln 43) or in direct contact. There was no other teaching that was to be discerned from Ghela ('283). It was not the purpose of Ghela ('283) to teach a conduit similar to that of Helmut and Takeuchi. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. §103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. §103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. §103(c) and potential 35 U.S.C. §102(e), (f) or (g) prior art under 35 U.S.C. §103(a).

16. **Claims 9 and 15 – 18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Takeuchi et al (US 4,440,156) in view of Helmut et al (DE 198 59 658 A1) in view of Ghela (US 6,619,283).**

17. **In re Claim 9**, Takeuchi et al ('156) discloses a heat exchanger having a vacuum tube (figs 1, 3) comprising:

- a vacuum tube (1 / 2; col 2, ln 26) having an inner wall (2);
- a fluid-conducting pipe system (4) adapted to hold a fluid (col 2, lns 28-29), wherein the fluid-conducting pipe system comprises an outer wall (inherent);
- at least one heat-conducting element (7, 8) made of metal ("thin metal plate"; col 2, ln 38) connecting the inner wall of the vacuum tube (2) to a the outer wall of the fluid-conducting pipe system (4) (col 3, lns 20 – 23); and
- means for collecting and concentrating solar energy ("solar heat-absorbing film" (3)) provided on a side of the inner wall of the vacuum tube (col 2, lns 18 – 20) facing away from the at least one

heat-conducting element (7, 8), wherein the outer wall of the fluid conducting pipe system is a metal wall ("metal pipe... preferably....copper"; col 2, lns 27, 28).

18. Takeuchi et al ('156) lacks wherein:

- each heat-conducting element
 - extends in a spiral shape along a cross- section of the heat exchanger, covers an angle of at least 450 degrees,
 - is attached at the outer wall of the fluid-conducting pipe system, and
- the outer wall of the fluid-conducting pipe system is centered concentric to the inner wall of the vacuum tube.

19. Helmut et al ('658) teaches a heat exchanger (figs 1, 2a (1)) having a vacuum tube (2) wherein:

- an outer wall of a fluid-conducting pipe (13) system is centered concentric to the inner wall of the vacuum tube (2), employing a counterflow heat exchange flow configuration, and
- each heat-conducting element (3) extends in a spiral shape along a cross- section of the heat exchanger covers an angle of at least 450 degrees (as apparent in fig 2a),

20. It would have been obvious to one having ordinary skill in the art at the time the invention was made modify the system of Takeuchi et al ('156), as taught by Helmut et al ('658), such that the fluid conducting pipe system is constructed as a concentric counterflow system in lieu of a single pass "U-tube" system to increase heat exchange surface area and thereby increase system efficiency.

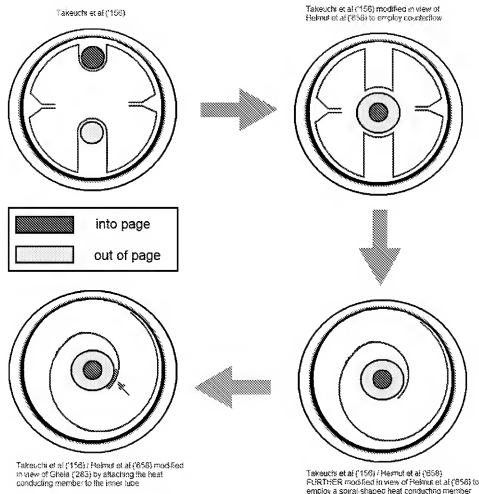
21. Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Takeuchi et al ('156), as taught by Helmut et al ('658) such that each heat-conducting element extends in a spiral shape along a cross-section, covering an angle of at least 450 degrees, in the system of Takeuchi et al ('156) in the system of in order to maximize the thermal output of a solar collector, for the purpose of increased efficiency.

22. Ghela ('283) teaches a solar collector pipe (70) wherein a heat-conducting element (72) is attached at the outer wall of a fluid-conducting pipe (71) system (col 11, lns 39 - 46).

23. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Takeuchi et al ('156), as taught by Ghela ('283), such that heat is more

readily transferred from the heat conducting elements to the fluid-conducting pipe system (col 11, lns 45, 46), thereby improving system efficiency.

24. The resultant combination of Takeuchi et al ('156) as taught by Helmut et al ('658) and Ghela ('283) would be as follows:



25. **Claims 1-8 and 10-14 (Cancelled)**

26. In re Claim 15, the heat exchanger of Takeuchi et al ('156) / Helmut et al ('658) / Ghela ('283) had been discussed, wherein the modified heat exchanger utilizes a single heat conducting element (Helmut et al ('658) fig 2a; (3)) over an angular range between 350 to 359 degrees or between 90 and 179 degrees. However, the heat exchanger of Takeuchi et al ('156) discloses the use of two heat

conducting elements (7, 8) spaced apart from one another in an angular arrangement on an outer wall of a fluid-conducting pipe system.

27. It would have been obvious to one having ordinary skill in the art to use the teaching of Takeuchi et al ('156) such that two heat conducting elements are utilized, doubling the collection area of the single heat conducting element of Helmut et al ('658) fig 2a; (3)), spaced apart from one another in an angular arrangement on an outer wall of the fluid-conducting pipe system over an angular range between 350 to 359 degrees or between 90 and 179 degrees, to optimally cover the entire internal circumference of the inner wall of the vacuum tube to in order to maximize the thermal output of a solar collector, for the purpose of increased efficiency.

28. Please also note that Helmut et al ('658) additionally teaches three heat-conducting elements (fig 2c; (3)), wherein three of the heat-conducting elements are spaced apart from one another in an angular arrangement on an outer wall of the fluid-conducting pipe system over an angular range that encompasses / covers the entire internal circumference of the inner wall of the vacuum tube, as further evidence that the mere duplication of the essential working parts of a device involves only routine skill in the art.

29. In re Claim 16, the heat exchanger of Takeuchi et al ('156) / Helmut et al ('658) / Ghela ('283) had been discussed, wherein Helmut et al ('658) teaches a fluid-conducting pipe system comprises an outer volume (6) and an inner volume (7) ("co-axial"; page 2, fourth paragraph) operable in a counter-current mode (fig 7).

30. In re Claim 17, the heat exchanger of Takeuchi et al ('156) / Helmut et al ('658) / Ghela ('283) had been discussed, wherein Takeuchi et al ('156) discloses the fluid is a heat-conducting fluid (col 3, Ins 6, 7), and the fluid is contained within the inner tube (7, 8).

31. In re Claim 18 the heat exchanger of Takeuchi et al ('156) / Helmut et al ('658) / Ghela ('283) has been discussed (see above in Claim 9), wherein Ghela ('283) teaches the at least one heat-conducting element is attached at the outer wall of a fluid-conducting pipe (71) system ("through a common extrusion process or... in direct contact" col 11, Ins 39 - 46). Hard-soldering a heat-conducting element at the outer wall of the fluid-conducting pipe system is merely another example of making two components into an

integral piece. It would have been obvious to one having ordinary skill in the art at the time the invention was made to hard-solder a heat-conducting element to an outer wall of a fluid-conducting pipe, since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art.

Conclusion

32. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
- Kenny (US 4,233,957) discloses an evacuated solar energy collector, utilizing a counterflow fluid heat exchange arrangement, with an absorber coating therein.
 - Hunt (US 4,205, 655) discloses an evacuated solar collector, utilizing a counterflow fluid heat exchange arrangement, with an inner absorber member welded to an inner tubular clued counter flow pipe, coated with a selective coating to absorb and retain solar energy.
 - Fehlner et al (US 4,067,315) discloses a solar heat pipe, wherein a spacer is a resiliently spirally wrapped wire that expands against an inner surface portion of the glass collector.
33. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).
34. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

35. Any inquiry concerning this communication or earlier communications from the examiner should be directed to FRANCES KAMPS whose telephone number is 571.270.5726. The examiner can normally be reached on M-F; 8-5.

36. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Rinehart can be reached on 571.272.4881. The fax phone number for the organization where this application or proceeding is assigned is 571.273.8300.

37. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866.217.9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800.786.9199 (IN USA OR CANADA) or 571.272.1000.

/FRANCES KAMPS/
Examiner, Art Unit 3743

/Kenneth B Rinehart/
Supervisory Patent Examiner, Art Unit 3743